What is Claimed is:

1. A substantially crystalline graphitic carbon nanofiber comprised of substantially graphite sheets that are substantially parallel to the longitudinal axis of the nanofibers, wherein the distance between graphite sheets is from about 0.335 nm to about 0.67 nm, and having a crystallinity greater than about 95%.

2. The nanofiber of claim 1wherein said substantially graphite sheets are separate and non-continuous sheets.

3. The nanofiber of claim 1 which is characterized as having continuous substantially graphite sheets forming a non-cylindrical multifaceted tubular structure.

4. The nanofiber of the claim 1 wherein the distance between the graphite sheets is from about 0.335 and 0.40 nm.

5. The nanofiber of claim 1 wherein at least a portion of the edge regions of the nanofiber contain a functional group selected from the group consisting of basic groups, acidic groups, and oxygenated groups.

6. The nanofiber of claim 5 wherein the functional group is a basic group that is a NH_4+ group.

7. The nanofiber of claim 5 wherein the functional group is an acid group which is a $COOH^-$ group.

8. The nanofiber of claim 5 wherein the functional group is an oxygenated group selected from the group consisting of hydroxyl, peroxide, ether, keto, and aldehyde.

9. A substantially crystalline graphitic carbon nanofiber comprised of substantially graphite discontinuous sheets that are substantially parallel to the longitudinal axis of the nanofibers, wherein the distance between graphite sheets is from about 0.335 nm to about 0.67 nm, and having a crystallinity greater than about 95%.

10. The nanofiber of the claim 9 wherein the distance between the graphite sheets is from about 0.335 and 0.40 nm.

11. The nanofiber of claim 9 wherein at least a portion of the edge regions of the nanofiber contain a functional group selected from the group consisting of basic groups, acidic groups, and oxygenated groups.

12. The nanofiber of claim 11 wherein the functional group is a basic group that is a NH_4+ group.

13. The nanofiber of claim 11 wherein the functional group is an acid group which is a $COOH^-$ group.

14. The nanofiber of claim 11 wherein the functional group is an oxygenated group selected from the group consisting of hydroxyl, peroxide, ether, keto, and aldehyde.

15. A substantially crystalline graphitic carbon nanofiber comprised of continuous substantially graphite sheets that are substantially parallel to the longitudinal axis of the nanofibers and which has a substantially non-cylindrical multifaceted tubular structure, wherein the distance between graphite sheets is from about 0.335 nm to about 0.67 nm, and having a crystallinity greater than about 95%.

16. The nanofiber of the claim 15 wherein the distance between the graphite sheets is from about 0.335 and 0.40 nm.

17. The nanofiber of claim 15 wherein at least a portion of the edge regions of the nanofiber contain a functional group selected from the group consisting of basic groups, acidic groups, and oxygenated groups.

18. The nanofiber of claim 17 wherein the functional group is a basic group that is a NH_4+ group.

19. The nanofiber of claim 17 wherein the functional group is an acid group which is a $COOH^-$ group.

20. The nanofiber of claim 17 wherein the functional group is an oxygenated group selected from the group consisting of hydroxyl, peroxide, ether, keto, and aldehyde.

21. A process for producing a substantially crystalline graphitic nanofiber wherein at least a portion of which are comprised of graphite sheets that are substantially parallel to the longitudinal axis of the nanofiber, which process comprises reacting a mixture of CO/H_2 in the presence of a catalyst selected from the group consisting of Fe, Fe:Cu bimetallic, and Fe:Ni bimetallic powder catalysts for an effective amount of time at a temperature from about 625°C to about 725°C.

22. The process of claim 21 wherein said nanofibers are characterized as having separate and non-continuous substantially graphite sheets.

23. The process of claim 21 wherein said nanofibers are characterized as having continuous substantially graphite sheets forming a non-cylindrical multifaceted tubular structure.

24. The process of claim 21 wherein the catalyst is an Fe:Cu bimetallic wherein the ratio of Fe to Cu is from about 1:99 to about 99:1.

25. The process of claim 24 wherein the ratio of Fe to Cu is from about 3:7 to about 7:3

26. The process of claim 21 wherein the catalyst is an Fe:Ni bimetallic wherein the ratio of Fe to Ni is from about 1:99 to about 99:1.

27. The process of claim 26 wherein the ratio of Fe to Ni is from about 3:7 to about 7:3

28. The process of claim 21 wherein the ratio of CO to H_2 is from about 95:5 to about 5:95.

29. The process of claim 28 wherein the ratio of CO to H_2 is from about 80:20 to about 20:80.

30. The process of claim 25 wherein the ratio of CO to H_2 is from about 80:20 to about 20:80.

31. The process of claim 21 wherein the crystallinity of the nanofiber is greater than about 98%.

32. The process of claim 25 wherein the crystallinity of the nanofiber is greater than about 98%.

33. The process of claim 21 wherein the particle size of the bimetallic powder is from about 0.25 nanometer to about 5 micrometer.

34. The process of claim 33 wherein the particle size of the bimetallic powder is from about 2.5 nanometers to about 1 micrometer.